SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS 3755B

Issued JUL 1983
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Superseding AMS 3755A

Powder, Fumed Silicon Dioxide

1. SCOPE:

1.1 Form:

This specification and its supplementary detail specifications cover silicon dioxide in the form of a white, amorphous powder.

1.2 Application:

This powder has been used typically as a thickening (thixotropic) agent for resin systems, but usage is not limited to such applications.

1.3 Safety - Hazardous Materials:

While the materials, methods, applications, and processes described or referenced in this specification may involve the use of hazardous materials, this specification does not address the hazards which may be involved in such use. It is the sole responsibility of the user to ensure familiarity with the safe and proper use of any hazardous materials and to take necessary precautionary measures to ensure the health and safety of all personnel involved.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order form a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

QUESTIONS REGARDING THIS DOCUMENT: (724) 772-7161 FAX: (724) 776-0243
TO PLACE A DOCUMENT ORDER: (724) 776-4970 FAX: (724) 776-0790

2.1 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959 or URL http://www.astm.org/cgi-bin/softcart-exe/store/store/htm?e+mystore.

ASTM D 1514	Carbon Black - Sieve Residue
ASTM D 2773	Loss on Ignition of Electrical Grade Magnesium Oxide
ASTM D 3037	Carbon Black - Surface Area by Nitrogen Adsorption
ASTM D 4820	Carbon Black - Surface Area by Multipoint B.E.T. Adsorption Nitrogen
ASTM E 300	Sampling Industrial Chemicals

3. TECHNICAL REQUIREMENTS:

3.1 Material:

Shall be a fumed, white, amorphous silica.

3.2 Properties:

Powder shall conform to the requirements shown in Table 1; tests shall be performed on the powder supplied and in accordance with test methods specified in 4.5.

TABLE 1 - Properties

Properties	Requirements
Surface Area	175 - 225 m^2/g
Grit Content retained on No. 325 mesh (45 µm) screen, maximum	0.02%
pH, 4% Aqueous Dispersion	3.8 - 4.3
Loss on Ignition by weight, maximum, 1000 °C (1832 °F), Moisture Free	2.0%

3.3 Quality:

The powder, as received by purchaser, shall be uniform in quality and condition, smooth, as free from foreign material as commercially practicable, and free from imperfections detrimental to usage of the powder.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of powder shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the powder conforms to specified requirements.

4.2 Classification of Tests:

4.2.1 Acceptance Tests: Surface area, grit content, pH (see Table 2), and quality (3.3) are acceptance tests and shall be performed on each lot.

4.2.2 Preproduction Tests: All technical requirements are preproduction tests and shall be performed prior to or on the initial shipment of powder to a purchaser, when a change in ingredients and/or processing requires reapproval as in 4.4.1, and when purchaser deems confirmatory testing to be required.

4.3 Sampling and Testing:

Shall be as follows:

4.3.1 For Acceptance Tests: Each lot of powder shall be sampled in accordance with ASTM E 300 at random to provide sufficient powder to perform all required tests. The number of determinations for each requirement shall be as specified in the applicable test procedure or, if not specified therein, not less than three.

4.3.1.1 A lot shall be all powder produced in a continuous production run from the same batch of raw material under the same fixed conditions and presented for vendor's inspection at one time.

4.3.1.2 When a statistical sampling plan has been agreed upon by purchaser and vendor, sampling shall be in accordance with such plan in lieu of sampling as in 4.3.1 and the report of 4.6 shall state that such plan was used.

4.3.2 For Preproduction Tests: As agreed upon by purchaser and vendor.

4.4 Approval:

4.4.1 Sample powder shall be approved by purchaser before powder for production use is supplied, unless such approval is waived by purchaser. Results of tests on production powder shall be essentially equivalent to those on the approved sample. Production powder made by a revised procedure shall not be shipped prior to receipt of reapproval. If necessary to make any change in ingredients, in type of equipment for processing, or in manufacturing procedures, manufacturer shall submit for reapproval a statement of the proposed changes in ingredients and/or processing and, when requested, sample product. Production powder made by the revised procedure shall not be shipped prior to receipt of reapproval.

4.4.2 Manufacturer of the powder shall make no significant change in material, processes, or methods of inspection from those on which the approval was based, unless the change is approved by the cognizant engineering organization. A significant change is one which, in the judgment of the cognizant engineering organization, could affect the properties or performance of the product.

4.5 Test Methods:

Shall be as shown in Table 2:

TABLE 2 - Test Methods

Property	Test Method
Surface Area	ASTM D 3037 or ASTM D 4820
Grit Content	ASTM D 1514
pH, 4% Aqueous Dispersion	4.5.1
Loss on Ignition	ASTM D 2773

4.5.1 pH, 4% Aqueous Dispersion:

4.5.1.1 Weigh 4.000 grams ± 0.010 of powder into a 250-mL beaker and add 100 mL ± 10 of distilled water with pH of not lower than 5.5. Boiling may be necessary to remove carbon dioxide to give a minimum pH of 5.5. (Do not adjust the pH of the water with caustic.)

4.5.1.2 Stir the mixture vigorously for not less than five minutes. When liquid agitation ceases, measure pH.

4.6 Reports:

The supplier of powder shall furnish with each shipment a report from the manufacturer showing the results of tests to determine conformance to the acceptance test requirements and stating that the powder conforms to the other technical requirements. This report shall include the purchase order number, lot number, AMS 3755B, manufacturer's product designation, date of manufacture, and quantity.

4.7 Resampling and Retesting:

If any sample used in the above test fails to meet the specified requirements, disposition of the powder may be based on the results of testing three additional samples for each original nonconforming sample. Failure of any retest sample to meet the specified requirements shall be cause for rejection of the powder represented. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 A lot of powder may be packaged in smaller quantities and delivered under the basic lot approval provided lot identification is maintained.

5.1.2 The powder shall be packed in sealed bags.

5.1.3 Individual bags shall be packed in an exterior container capable of protecting the powder, during shipment and storage, against damage from exposure to weather or any other normal hazard.

5.1.4 Each bag and each exterior shipping container shall be legibly marked with not less than the following information in such a manner that the markings will not smear or be obliterated during normal handling or use:

POWDER FUMED SILICON DIOXIDE
AMS 3755B/____*
MANUFACTURER'S IDENTIFICATION _____
PURCHASE ORDER NUMBER _____
DATE OF MANUFACTURE _____
LOT NUMBER _____
QUANTITY _____

5.1.5 Containers of powder shall be prepared for shipment in accordance with commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the powder to ensure carrier acceptance and safe delivery.

6. ACKNOWLEDGMENT:

A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.

7. REJECTIONS:

Powder not conforming to this specification or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES:

8.1 A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this specification. An (R) symbol to the left of the document title indicates a complete revision of the specification, including technical revisions. Change bars and (R) are not used in original publications, nor in specifications that contain editorial changes only.

8.2 Dimensions and properties in inch/pound units and the Celsius temperatures are primary; dimensions and properties in SI units and the Fahrenheit temperatures are shown as the approximate equivalents of the primary units and are presented only for information.

8.3 Procurement documents should specify not less than the following:

AMS 3755B
Size of individual packages desired
Quantity of powder desired
Special packaging, if required.

PREPARED UNDER THE JURISDICTION OF AMS COMMITTEE "P"